cellor of the Exchequer by Mr. Haldane as president of the British Science Guild.

It was also stated that the Goldsmiths' Company had very generously made a donation of 1000*l.*, with the request that it should be devoted to some specific object.

The very cordial thanks of the board were voted to the Chancellor of the Exchequer, Mr. Haldane, Sir J. Lawrence, Sir J. Brunner, and the other gentlemen who had interested themselves in the House of Commons petition, and also to the Goldsmiths' Company.

The director gave an account of the proposed additions to the buildings rendered possible by the increased grant, and explained the plans which had been prepared by the building committee. The suggestion that the work of erecting these buildings should now be pressed forward was cordially welcomed, and at a meeting of the executive committee held later power was given to the building committee to take the necessary steps. The board then adjourned to inspect the laboratory and to view the new electrical buildings, which are now approaching completion. They have been erected by Messrs. Mowlem and Co., at a cost of about 8000*l.*, to the design of Messrs. Mott and Hay, who very kindly gave their services, while with marked generosity Messrs. Mowlem's tender was based on the cost price of the buildings.

It is hoped that they may be opened on June 25 on the occasion of the visit of the foreign guests of the Institution of Electrical Engineers. In view of this ceremony the invitations on March 16 were restricted to members of the board and their personal friends, the usual annual gathering of friends of the laboratory being postponed until June.

NOTES.

A preliminary programme has been received of the events in connection with the Franklin bi-centenary, which the American Philosophical Society will celebrate at Philadelphia on April 17–20. The opening ceremony will take place on April 17, when the president, Prof. Edgar F. Smith, will deliver an address. Numerous papers on subjects of science will be read on April 18 by distinguished American men of science. In addition to these, Sir George Darwin, K.C.B., F.R.S., will read a paper on the figure and stability of a liquid satellite, and Prof. Hugo de Vries, of Amsterdam, will deal with elementary species in agriculture. Addresses will be given during the evening of the same day by Prof. E. L. Nichols, on Franklin's researches in electricity, and Prof. E. Rutherford, F.R.S., on the modern theories of electricity and their relation to the Franklinian theory. On April 19 honorary degrees will be conferred by the University of Pennsylvania, and an oration will be delivered by the Hon. Hampton L. Carson, Attorney-General of Pennsylvania. Ceremonies will be performed on this day at the grave of Franklin. On April 20 addresses in commemoration of Franklin will be given by Dr. H. H. Furness, who will speak of him as citizen and philanthropist; Dr. C. W. Eliot will pronounce a eulogy of him as printer and philosopher; and Dr. J. H. Choate as statesman and diplomatist. The presentation of the Franklin medal to the Republic of France, in accordance with the Act of Congress, will be made by the Hon. Elihu Root, Secretary of State.

Dr. Libbertz, the scientific director of the bacteriological department of the Farbwerke, Hochst a. M., is going to South Africa with Dr. Robert Koch to study the question of sleeping sickness.

We learn from the *British Medical Journal* that the donations to the fund being collected for the establishment of an Institute of Cancer Research in connection with the University of Heidelberg now amount to 34,000*l.*

An exhibition devoted to engineering and mechanical appliances will be held at Olympia from September 15 to October 17. Sir William White, K.C.B., is president, and the list of patrons includes the presidents of the various engineering societies. The offices of the exhibition are at Balfour House, Finsbury Pavement, London.

The eighth International Agricultural Congress will be held in Vienna on May 21–25, 1907. The proceedings of the congress will be carried on in eleven sections, of which section ii. will be devoted to questions on instruction in agriculture and forestry, section vi. to agricultural industry, section vii. to the protection of plants, and section x. to vine growing, &c.

A Reuter telegram states that M. Mylius Erichsen's Danish expedition to the north-east coast of Greenland will leave Copenhagen at the end of June, and will proceed *viâ* the Færöe Islands and east Iceland to the east Greenland pack-ice, through which the explorer expects to be able to penetrate into East Greenland between 57° and 77° northern lat. In addition to the Danish members, the exploring party will probably include Dr. A. Wegener, from Germany, as physicist and meteorologist, and Dr. Baron Firchs, from Russia, as geologist.

According to a Reuter message from Peshawar, a letter from the Governor of Balakh states that while some peasants were preparing their land for cultivation they came upon some ruins, which on further examination proved to be wall enclosures of a ruined city. The Governor visited the spot, and found the ruins of a large city, with some gold coins, the inscriptions on which nobody could read. Old Afghans said they had heard from their ancestors that a large Kafir (or infidel) city existed in the vicinity, which had been destroyed long since, and that in the ruins were buried the treasure of the Kafir kings. Some of the coins were sent to the Ameer for inspection.

The Washington correspondent of the *Times* states that the report of the American members of the International Commission for the Preservation of the Niagara Falls recommends that legislation be passed, based on a treaty between America and Canada, to prevent further depletion of the water, to maintain the present scenic effects, and to regulate the electrical supply companies which are using the Falls for power. It is proposed to limit the diversion of the waters on the American side to 28,500 cubic feet a second, and the diversion on the Canadian side to 36,000 cubic feet. This advantage of Canada is in reality only on paper, as the power generated on the Canadian side is used largely in the United States. The report states that the diversion of water by works already authorised is likely to injure the Falls, and will possibly leave the American fall dry. It is estimated, however, that five-sixths of the total of 60,900 feet a second authorised chiefly affects the Canadian Horseshoe Falls.

Mr. Frank Stromsten gives a good account of the anatomy and development of the venous system of various species of turtles (*Amer. Journ. of Anatomy*, iv., 1905, p. 453). About forty turtles of the more common species were dissected, and fifty turtle embryos were studied for the development of the veins. In general, the development of the veins of the hepatic and renal portal systems is the same in turtles as in lizards and snakes, but there are important differences.

Science Bulletin No. 7 of the Brooklyn Institute contains an account by Mr. C. Schaeffer of beetles new to the United States, and also a description, by Dr. H. G. Dyar, of new moths from Arizona. Among the latter use is made of the generic name Janassa, usually applied to a group of Palæozoic fishes. The marine ostracod crustaceans of Vineyard Sound form the subject of a paper by Mr. J. A. Cushman in the Proceedings of the Boston (U.S.A.) Society of Natural History, vol. xxxii., No. 10.

The results of a study of the wing-structure of the hymenopterous insects of the group Tenthredenoidea, published in No. 1438 of the Proceedings of the U.S. National Museum, have enabled Mr. A. D. MacGillivray to demonstrate the origin of the modern complex hymenopterous wing from one of the simplest type. Throughout the line of evolution all the modifications have tended to render the wing more efficient as an organ of flight, this efficiency being due to the arrangement of the veins in such a manner as to stiffen the areas subjected to the greatest strain.

In the *Verhandlungen* of the German Zoological Society for 1905 Prof. Simroth discusses the geographical distribution of land-shells, salamanders, and ganoid fishes, more especially in connection with climatic changes due to precession of the equinoxes; while Dr. K. Guenther contributes a review of theories and facts bearing on bird-migration. Special interest attaches to an article by Dr. O. Abel on the phylogenetic evolution of the cetacean dentition and the systematic relations of the Physeteridæ. Both physeteroids and ziphioids are considered to have originated, independently, from squalodonts during the Miocene, while the latter are connected with the true Eocene zeuglodonts by means of Microzeuglodon. If this phylogeny be well founded, we may accept the descent of cetaceans from creodont carnivores.

Among the contents of part ii. of the third volume of the quarterly issue of the Smithsonian Miscellaneous Collections is a paper on the great whale-shark (*Rhinodon typicus*), by Mr. B. A. Bean, in which figures are given of the type specimen taken at the Cape in 1828, and of an individual recently stranded on the Florida coast. This shark is stated to grow to a length of 60 feet, and is thus the next largest animal to the biggest kinds of whales. Like its relative the northern basking shark, it has a terminal mouth and feeble dentition, and is quite harmless to man. In a second article Mr. W. H. Osgood describes remains of certain ancestral musk-oxen from Alaska and other parts of Arctic America, while in a third Mr. T. Gill furnishes a very interesting account of the carp group. In the course of a paper on Mexican land-shells, Dr. W. H. Dall describes a new genus, Hendersonia, remarkable for having developed a multispiral discoid shell, with an upturned mouth, quite unlike those of its relatives.

In the Bulletin of the Johns Hopkins Hospital for February (xvii., No. 179) the biographical sketches of medical worthies of former times, which have formed a marked and interesting feature of recent issues, are continued, the subject of this month's sketch (by Dr. Walter Steiner) being the Rev. Gershom Bulkeley, of Connecticut, born about 1635, who, having served in the ministry, was obliged to resign owing to weakness of voice, and subsequently devoted himself to the practice of medicine. Articles of medical interest, reports of societies, &c., complete the number.

In his presidential address to the Entomological Society of London, Mr. F. Merrifield surveyed the results obtained by other investigators and himself in studies of the influence of temperature and other conditions on insects. As a result of artificial experiments, it has been found that alteration of temperature on developing insects affects to some extent the colouring of the adults. Apparently high and low temperatures do respectively make the insects tend to approximate in colouring to warmer temperate and arctic types.

The issue of the Philippine Journal of Science, the first number of which (January) has reached us, is further proof of the manner in which scientific research is being cultivated by the American Government. The journal is well printed on paper 10 inches by 7 inches, and contains several excellent illustrations. The editors are Dr. Paul Freer and Dr. Richard Strong and Mr. H. D. McCaskey, and the contents of the present number are three articles on the cocoa-nut palm and oil, by Dr. Freer, Mr. E. B. Copeland, and Mr. H. S. Walker respectively; the occurrence of *Schistosoma japonicum* vel. *Cattoi* (a parasite fluke) in the Philippines; and a study of some tropical ulcerations of the skin, by Dr. Strong.

Prof. Adami discusses in an interesting paper the question of the transference of bovine tuberculosis to man through milk (*Amer. Medicine*, ix., 1905, p. 683). He holds that such conveyance is not so frequent as is generally accepted (von Behring goes so far as to attribute most human tuberculosis to the use of tuberculous milk in infancy). Kitasato has recently published statistics of the incidence of tuberculosis in Japan, which show that the deaths from tuberculosis in Japan are just about in the same proportion to the total deaths and to the total population as are the deaths from this disease in European countries; but primary intestinal tuberculosis in the young (which has been attributed to the ingestion of tuberculous milk) is rather more prevalent (30 per cent. of the total) than in Europe and America (25 per cent.). The use of cows' milk for feeding infants is unknown in Japan, and Prof. Adami therefore holds that the facts gathered in Japan show that intestinal tuberculosis, which is as frequent there as in Europe, cannot be attributed to the ingestion of infected cows' milk, and cannot therefore be of bovine origin; and the inevitable conclusion is that if intestinal tuberculosis is moderately frequent, and not of bovine origin, then similarly a large proportion of European intestinal tuberculosis is in all probability not due to infection from milk.

Two leaflets referring to British East Africa have been received; of these, leaflet No. 12 of the Department of Agriculture, Nairobi, provides a list of forage plants with their special characteristics, and leaflet No. 2, issued by the Forest Department, deals with native trees. The list of native trees, with vernacular names and uses, is accompanied by a few hints as to the selection of suitable species, the collection of seeds, and the methods of planting.

The Kew Bulletin for the year 1900 (Nos. 178–180) reached us a few days ago! The Bulletin, which has been in abeyance since the volume for 1901 was completed—with the exception of a part issued as No. 1, 1905—was reinaugurated with a part recently published as No. 1, 1906. This number is devoted entirely to descriptions of new specimens, the contents being "Decades Kewenses, xxxvi.-xl.," "Diagnoses Africanæ, xiv.," and "New Orchids, Decade 26." The first furnishes a list of ferns and flowering plants, of which the majority were collected by Dr. Henry in China. An interesting species is *Cuscuta Upcraftii*, that has been grown on potatoes from seed collected in Tibet by Mr. W. M. Upcraft. A list of staffs in botanical departments at home, in India, and the colonies has also been published as Appendix iv., 1905.

AN interesting report on the mineral resources of the Kalahasti Zamindary, Madras, has been published by Mr. V. S. Sambasiva Iyer, of the Mysore Geological Department (Bangalore, 1906). Gold, iron ore, barytes, and marble are met with. The evidences obtained and the records of old workings fully justify a detailed prospecting of the Sirasinambedu gold deposits.

IN the *Engineering Magazine* for March there is an admirably illustrated account of gypsum mining in the vicinity of Paris by M. Jacques Boyer. Interesting details are given of the calcination of the material and of the preparation of plaster of Paris. At the present time some eighty companies are engaged in the industry near Paris, and 5500 workmen are employed.

A REMARKABLE example of the surface outcrop of an iron ore deposit is illustrated in an article on iron ore in Mexico, by Mr. R. H. Anderson, in the *Engineering and Mining Journal* of New York (vol. lxxxi., No. 9). The deposit is situated on the Las Truchas creek, near the boundary of the States of Michoacan and Guerrero. The outcrop is 10,000 feet in length and 4000 feet wide. It rises to a height of 450 feet.

THE paper on smoke prevention contributed by Mr. A. J. Martin to the conference on smoke abatement at Westminster in December, 1905, has now been published in pamphlet form (London: Sanitary Publishing Co., Ltd., price 1*s*.). Mr. Martin advocates a scheme of long-distance gas transmission, and urges that a strong permanent committee be appointed by the Government to deal with the evils produced by smoky fogs, and the desirability of providing a cheap, smokeless fuel for domestic and industrial use.

THE opening number of vol. iii. of the *Bolletino* of the Italian Meteorological Society contains an interesting article on the supposed connection between rainfall and volcanic activity, unsigned, but evidently emanating from the Observatory of Catania. The author finds that whether account is taken of the daily variation in the activity of Etna during the eruption of 1892, or the whole series of eruptions the date of which is known with accuracy, there is no evidence of any connection between the volcanic activity of Mount Etna and the local rainfall; neither of these determines or is determined by the other.

THE weather during the past week has been unusually cold and disagreeable over the whole of the British Islands, the day temperatures being about 10° below the average for fifty years, with sharp frost at night, and frequent showers of snow and hail. These conditions were produced by a complex distribution of barometric pressure, the chief features of which were an anticyclone lying over the Atlantic at some distance to the west of our shores, with areas of low pressure over Germany and the south-west of France, and they were consequently accompanied by bitter northerly and north-easterly winds, whilst gales were experienced on several coasts. The following low night screen temperatures have been reported to the Meteorological Office:—22° in the Midland counties and 23° in the south of England. At Greenwich the exposed thermometer fell to 18° on the morning of March 23. Sunshine exceeded the normal amount in several districts.

THE University of Innsbruck publishes in a concise and handy form the results of the observations made at its meteorological observatory, situated about 1886 feet above the sea. The last pamphlet received contains observations and mean results for 1902, taken three times a day, together with hourly values from various self-recording instruments. The tables have been prepared by Dr. W. Trabert, which is a sufficient guarantee for the accuracy of the work. There is a useful appendix by Mr. H. von Ficker on cloud formation in the Alpine valleys from observations extending from January, 1904, to March, 1905, with valuable notes on the occurrence and behaviour of the Föhn wind. This phenomenon is well known to Alpine observers as, generally speaking, a dry, warm wind, to the influence of which the melting of the snow in the spring is chiefly due.

THE current number of the *British Journal of Psychology* (vol. i., part iv.) contains as its main feature an article by Dr. W. H. R. Rivers entitled "Observations on the Senses of the Todas," a small and possibly degenerating community of about 800 individuals, living among the Nilgiri Hills in southern India. The methods of observation were similar to those used by the Cambridge expedition to the Torres Straits. Visual acuity, colour-vision, visual illusions, tactile discrimination, tactile illusions, sensibility to pain, smell, taste, hearing, were all made the subject of tests. Of these the most elaborately treated are visual illusions, particularly the illusion of compared horizontal and vertical lines, and Dr. Rivers puts the results obtained from the Todas in this department of observation alongside those obtained from Cambridge undergraduates. In his general conclusions he lays stress on the difference in the part played by inference in the process of determining the sensory threshold, and the consequent difficulty of comparing sense-acuity in races of different culture. This play of inference reaches its greatest scope in the case of smell. In visual acuity and the tactile acuity of the forearm it would appear that the Todas have a slighter degree of sensibility than more civilised races, but they are inferior rather than superior in acuity of smell, and probably in acuity of hearing; they are also less sensitive to pain. Among other articles are those of Dr. James Ward, "Is 'Black' a Sensation?" and of Mr. W. McDougall, on "The Illusion of the 'Fluttering Heart' and the Visual Functions of the Rods of the Retina." Mr. McDougall points out that two quite distinct illusory appearances have been hitherto confused and brought together under the designation "the fluttering heart," and he claims that the true explanation of one of these is to be found in a suggestion made by Prof. J. von Kries.

IN the *Chemiker Zeitung* for March 21 is an interesting report, by Dr. E. Gerlach, dealing with the advances made by electrotechnical industries during last year. The writer deals particularly with electrical illumination, telegraphy and telephony, new accumulators, dynamo machines, electrical heating, power transmission, electrical railways, conductors and insulators, and measuring instruments.

As is well known, the carbides of different metals yield different hydrocarbons when acted upon by water. Thus while calcium carbide gives acetylene, aluminium carbide produces marsh gas (methane). We learn from the *Zeitschrift für Elektrochemie* (vol. xii., p. 20) that in St. Alban, France, a carbide is now being manufactured from which ethylene is evolved when it is acted upon by water. The ethylene so obtained is pumped into sulphuric acid, by which it is absorbed with production of ethyl hydrogen sulphate. Now when ethyl hydrogen sulphate is acted upon by water, alcohol and sulphuric acid are produced. By distillation the alcohol can be obtained free from the sulphuric acid, and the sulphuric acid can again be obtained in the concentrated condition by evaporation. Furthermore, the metallic oxide which is used in the production of the carbide is again obtained when the carbide is acted upon by water, so that the production of alcohol is summed up in the equation carbon+energy=alcohol. Up to the present it has been found necessary to use four times the quantity of carbon which should theoretically be required. How much more energy it is necessary to employ than is required by the theory is not stated. We remember that so far back as 1893, when the calcium carbide industry was in its infancy, it was suggested that the acetylene might by reduction with hydrogen be converted into ethylene, and the ethylene so obtained be employed for the manufacture of alcohol. In fact, we believe that several patents were taken out upon the subject. Owing to the difficulty of reducing acetylene, the process could hardly be expected to be a success. In the present case, however, provided the formation of the carbide is not too costly and the recovery of the sulphuric acid and metallic oxide not too expensive, the process seems to possess at any rate the elements of success.

THE first part has been received of an "Atlas of the World's Commerce," by Mr. J. G. Bartholomew, which is to be published by Messrs. George Newnes, Ltd., in twenty-two parts. The parts, which cost 6*d.* each net, are to appear fortnightly.

MR. DAVID NUTT has issued a ninth edition of the late Prof. A. Milnes Marshall's well known book on "The Frog: an Introduction to Anatomy, Histology, and Embryology." The work has been edited by Dr. F. W. Gamble, who has revised the chapter on development and added some figures.

A NEW monthly periodical, entitled *Science and Technology*, price sixpence net, has just appeared. It is intended to be of interest and assistance to teachers and students. The first number contains articles dealing with educational administration, examination syllabuses, and reports of meetings. The only contribution of a wholly scientific character is a reprint of Prof. S. P. Thompson's lecture at the Royal Institution on the electric production of nitrates from the atmosphere.

A THIRD edition of Sir William Ramsay's "Gases of the Atmosphere. The History of their Discovery," has been published by Messrs. Macmillan and Co., Ltd. The first edition of the book, published in 1896, included a non-technical description of argon, discovered in the atmosphere in 1894. To the second edition of 1900 a new chapter was added describing the other four inactive gases discovered to be present in air—helium, separated from the atmosphere in 1900, and neon, krypton, and xenon, discovered in 1898, and separated from argon and from each other during 1899 and 1900. The present edition has also been enlarged by the addition of another chapter, this one treating of the radio-active gases produced by the disintegration of radium and radium-thorium, which have been added recently to the list of constituents of the atmosphere.

OUR ASTRONOMICAL COLUMN.

COMET 1906*c*.—From observations made on March 19, 20, and 21, Dr. Strömgren has computed the following elements and ephemeris for the comet discovered by Mr. Ross on March 18:—

Elements.

$$T = 1906 \text{ Feb. } 22{\cdot}216 \text{ Berlin M.T.}$$

$$\left.\begin{aligned} \varpi &= 281^\circ\ 24'{\cdot}1 \\ \Omega &= 73^\circ\ \ 2'{\cdot}1 \\ i &= 80^\circ\ 34'{\cdot}0 \end{aligned}\right\} 1906{\cdot}0$$

$$\log q = 9{\cdot}88336$$

Ephemeris 12h. M.T. Berlin.

1906	α h. m. s.	δ ° ′	log Δ	Brightness
Mar. 29	2 38 33	+ 4 11·5	0·2356	0·63
April 2	2 48 40	+ 7 38·4	0·2547	0·53
6	2 58 9	+10 47·5	0·2732	0·44

(*Kiel Circular*, No. 87.)

OBSERVATION OF COMET 1905*c* AFTER PERIHELION.—A letter received from Prof. H. R. Morgan (Glasgow, U.S.A.) by Prof. Pickering states that the former observed Giacobini's comet, 1905*c*, on February 21, that is, since it appeared to the east of the sun.

The comet's apparent position at 7h. 40m. 44s. (Glasgow M.T.) was $\alpha = 1\text{h. } 8\text{m. } 29{\cdot}2\text{s.}$, $\delta = -11^\circ\ 9'\ 11''$, which gave corrections of −11s. and $-3'{\cdot}4$ to Herr Wedemeyer's ephemeris on the date of observation (*Astronomische Nachrichten*, No. 4079).

NEW VARIABLE STARS IN THE REGION ABOUT γ SAGITTÆ.—From the comparison of several photographs taken with the Bruce telescope, Prof. Wolf has discovered fifty-five new variable stars in the region about γ Sagittæ.

In No. 4079 of the *Astronomische Nachrichten* he gives the details concerning the discovery and measurement of each star, and, in addition, a list showing the position (1855·0) and the magnitude on various dates between 1900·7 and 1905·7. Forty-seven circular charts which accompany the paper show the region immediately surrounding each variable.

THE SUPPOSED NEBULOSITY AROUND NOVA AQUILÆ NO. 2.—In the opinion of Prof. Frost, the suggestion that the nebulous appearance of images of Nova Aquilæ No. 2 is entirely due to chromatic aberration is the correct one.

Plates taken with the 24-inch *reflector* at Yerkes Observatory on September 21 and 27, and October 23, 1905, show no nebulosity, whilst Prof. Wolf has obtained similar effects to this apparent nebulosity with other stars having peculiar spectra. A third argument against the phenomenon being due to true nebulosity is that, in order to produce the image obtained, the intrinsic brightness would have to be at least 1800 times as bright, in proportion to the light of the star, as that of the nebula known to exist around Nova Persei (*Astronomische Nachrichten*, No. 4079).

SOME TESTS OF THE SNOW TELESCOPE.—A very interesting note by Prof. Hale, published in No. 1, vol. xxiii., of the *Astrophysical Journal*, describes the present condition, and some tests, of the large Snow telescope which has been erected at the Solar Observatory, Mount Wilson.

The greatest inconvenience encountered in the early use of this instrument was in connection with the spectroheliograph work. Three mirrors are employed, of which the first, the 30-inch cœlostat mirror, reflects the solar rays on to a 24-inch plane mirror, which in turn directs the beam on to the 24-inch concave mirror of 60-feet focus, which forms the image of the sun on the primary slit.

When the instrument was used, with a high sun, on a hot, windless day, it was found that a serious change of focus, amounting in some cases to 12 inches, occurred, and, worse still, the mirrors became distorted, giving a difference of focus for the opposite limbs of the image of as much as 3 inches.

On days when a cool breeze blew across the surface of the mirror the change was less, so arrangements have now been made to send a current of air across the face of each mirror between the exposures, by means of fans.

Prof. Hale has found that an hour after sunrise is the best time for solar work, and after that an hour before sunset.